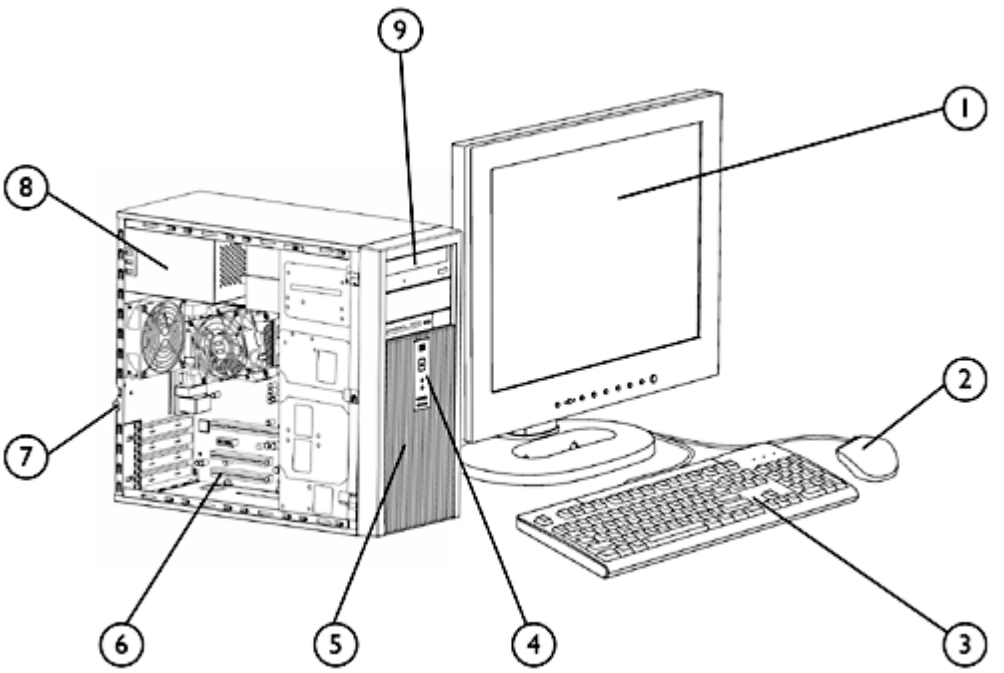
*Overview*

Microtower




1. Monitor (sold separately)
2. PS/2 Scroll Mouse
3. HP Standard Keyboard
4. (2) USB 2.0 ports, audio ports
5. (2) internal 3.5" drive bays
6. (2) full-height PCI 2.3 slots, (1) PCI-E x1 slot, (1) PCI-E x16 slot
7. (4) USB 2.0 ports, (1) serial port, (1) parallel port, (2) PS/2, (1) RJ-45, (1) VGA, (1) audio in – (1) audio out – (1) MIC
8. 250-watt max power supply
9. (2) external 5.25" drive bays for optional optical drives; (1) external 3.5" drive bay for optional media reader or diskette drive

## At A Glance

- Intel® Pentium 4 processors, Intel Celeron D processors
- Choice of operating systems:
  - Genuine Windows XP Home
  - Genuine Windows XP Professional
  - FreeDOS
- ATI Radeon Xpress 200 chipset
- Built-in ATI graphics processor derived from the Radeon X300
- PCI Express I/O bus
- Integrated SATA 1.5-Gb/s controller
- Integrated Ultra ATA/100 controller
- Integrated Fast Ethernet 10/100 Network Connection
- Choice of hard drives and optical drives
- DDR2 SDRAM system memory
- Protected by HP Services, including a 1-1-1 standard warranty. Certain restrictions & exclusions apply.

*Standard Features - Select Models*

Standard Models

| | |
|---|---|
| EN283UT#ABA | Promo dx2200M/C346/80hnc/256L/3uf US<br>HP dx2200 Microtower, Genuine Windows XP Home SP2, ATI Radeon Xpress 200 chipset, Intel Celeron D 346 3.06-GHz, 256-KB L2 cache, 533-MHz FSB, 256-MB PC2-5300 (DDR-667) DIMM Single-Channel (1x256), Integrated Graphics, 80-GB SATA Hard Drive (7200 rpm) 3.0 GBps, 48X CD-ROM drive, No Floppy Drive, Integrated audio with internal speaker, Realtek 8100c 10/100 LAN controller, Norton Antivirus 2005, Standard PS/2 Keyboard, HP USB 2-button Optical Scroll Mouse, 1-year Parts, 1-year Labor, 1-year Onsite warranty |
| EN284UT#ABA | Promo dx2200M/C346/80hnc/256L/4uf US<br>HP dx2200 Microtower, Genuine Windows XP Professional SP2, ATI Radeon Xpress 200 chipset, Intel Celeron D 346 3.06-GHz, 256-KB L2 cache, 533-MHz FSB, 256MB PC2-5300 (DDR-667) DIMM Single-Channel (1x256), Integrated Graphics, 80-GB SATA Hard Drive (7200 rpm) 3.0 GBps, 48X CD-ROM drive, No Floppy Drive, Integrated audio with internal speaker, Realtek 8100c 10/100 LAN controller, Norton Antivirus 2005, Standard PS/2 Keyboard, HP USB 2-button Optical Scroll Mouse, 1-year Parts, 1-year Labor, 1-year Onsite warranty |
| EN285UT#ABA | Promo dx2200M/C346/80hnc/512L/4uf US<br>HP dx2200 Microtower, Genuine Windows XP Professional SP2, ATI Radeon Xpress 200 chipset, Intel Celeron D 346 3.06-GHz, 256-KB L2 cache, 533-MHz FSB, 512-MB PC2-5300 (DDR-667) DIMM Single-Channel (1x512), Integrated Graphics, 80-GB SATA Hard Drive (7200 rpm) 3.0 GBps, 48X CD-ROM drive, No Floppy Drive, Integrated audio with internal speaker, Realtek 8100c 10/100 LAN controller, Norton Antivirus 2005, Standard PS/2 Keyboard, HP USB 2-button Optical Scroll Mouse, 1-year Parts, 1-year Labor, 1-year Onsite war |
| EN286UT#ABA | Promo dx2200M/P4-524/80hnd/512L/4f US<br>HP dx2200 Microtower, Genuine Windows XP Professional SP2, ATI Radeon Xpress 200 chipset, Intel Pentium 4 524 3.06GHz HT, 1-MB L2 cache, 533-MHz FSB, 512-MB PC2-5300 (DDR-667) DIMM Single-Channel (1x512),Integrated Graphics, 80-GB SATA Hard Drive (7200 rpm) 3.0 GBps, 16X/48X DVD-ROM drive, No Floppy Drive, Integrated audio with internal speaker, Realtek 8100c 10/100 LAN controller, Norton Antivirus 2005, Standard PS/2 Keyboard, HP USB 2-button Optical Scroll Mouse, 1-year Parts, 1-year Labor, 1-year Onsite warranty |
| EN287UT#ABA | Promo dx2200M/P-524/80hnw/512L/4uf US<br>HP dx2200 Microtower, Genuine Windows XP Professional SP2, ATI Radeon Xpress 200 chipset, Intel Pentium 4 524 3.06-GHz HT, 1-MB L2 cache, 533-MHz FSB, 512-MB PC2-5300 (DDR-667) DIMM Single-Channel (1x512),Integrated Graphics, 80-GB SATA Hard Drive (7200 rpm) 3.0 GBps, 48X/32X/48X/16X Combo Drive, No Floppy Drive, Integrated audio with internal speaker, Realtek 8100c 10/100 LAN controller, Norton Antivirus 2005, Standard PS/2 Keyboard, HP USB 2-button Optical Scroll Mouse, 1-year Parts, 1-year Labor, 1-year Onsite warranty |
| EN288UT#ABA | Promo dx2200M/P4-524/80hnw/1GBL/4uf US<br>HP dx2200 Microtower, Genuine Windows XP Professional SP2, ATI Radeon Xpress 200 chipset, Intel Pentium 4 524 3.06-GHz HT, 1-MB L2 cache, 533-MHz FSB, 1.0-GB PC2-5300 (DDR-667) DIMM Single-Channel (1x1.0GB),Integrated Graphics, 80-GB SATA Hard Drive (7200 rpm) 3.0 GBps, 48X/32X/48X/16X Combo Drive, No Floppy Drive, Integrated audio with internal speaker, Realtek 8100c 10/100 LAN controller, Norton Antivirus 2005, Standard PS/2 Keyboard, HP USB 2-button Optical Scroll Mouse, 1-year Parts, 1-year Labor, 1-year Onsite warranty |

**Processor and Speed**
One of the following

**Intel Celeron D Processors:**

Intel Celeron D 326 Processor
(2.53-GHz, 256-KB L2 cache, 533-MHz FSB)

Intel Celeron D 331 Processor
(2.66-GHz, 256-KB L2 cache, 533-MHz FSB)

Intel Celeron D 336 Processor
(2.80-GHz, 256-KB L2 cache, 533-MHz FSB)

Intel Celeron D 346 Processor
(3.06-GHz, 256-KB L2 cache, 533-MHz FSB)

Intel Celeron D 355 Processor
(3.33-GHz, 256-KB L2 cache, 533-MHz FSB)

**Intel Pentium 4 Processors:**

Intel Pentium 4 516 Processor
(2.93-GHz, 1-MB L2 cache, 533-MHz FSB)

Intel Pentium 4 519K Processor
(3.06-GHz, 1-MB L2 cache, 533-MHz FSB)

**Intel Pentium 4 Processors with Hyper-Threading Technology:**

Intel Pentium 4 521 Processor
(2.80-GHz, 1-MB L2 cache, 800-MHz FSB)

Intel Pentium 4 524 Processor
(3.06-GHz, 1-MB L2 cache, 533-MHz FSB)

Intel Pentium 4 630 Processor
(3.0-GHz, 2-MB L2 cache, 800-MHz FSB)

Intel Pentium 4 640 Processor
(3.2-GHz, 2-MB L2 cache, 800-MHz FSB)

Intel Pentium 4 541 Processor
(3.2-GHz, 1-MB L2 cache, 800-MHz FSB)

*NOTE: Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families.

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**Operating Systems and Application Software**

Genuine Microsoft Windows XP Home SP2

Genuine Microsoft Windows XP Professional SP2

Free DOS

Microsoft Office 2003 Basic
Microsoft Office 2003 Small Business
Microsoft Office 2003 Professional
Microsoft Works 8.5

Roxio DigitalMedia Plus (by SONIC)*
Roxio CinePlayer*
Dantz Retrospect Express 7*
Norton Antivirus 2005 with 60 day Live Update Subscription (availability varies by region)
Sun Java Runtime Environment
Google Toolbar

* Supporting software available with certain optical drive configurations

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*Available Technology and Features*

| | |
|---|---|
| **Hard Drives** | 40-GB Serial ATA 1.5-Gb/s Hard Drive (7200 rpm)<br>80-GB Serial ATA 3.0-Gb/s Hard Drive (7200 rpm)<br>160-GB Serial ATA 3.0-Gb/s Hard Drive (7200 rpm)<br>250-GB Serial ATA 3.0-Gb/s Hard Drive (7200 rpm)<br>NOTE: The HP Compaq dx2200 Microtower Serial ATA interface supports data transfer rates up to 1.5 Gb/s. |
| **System Memory** | 256-MB DDR2 Synch DRAM PC2-5300 (667-MHz) Non-ECC (1 x 256-MB)<br>512-MB DDR2 Synch DRAM PC2-5300 (667-MHz) Non-ECC (1 x 512-MB)<br>1-GB DDR2 Synch DRAM PC2-5300 (667-MHz) Non-ECC (1 x 1-GB)<br>NOTE: The HP Compaq dx2200 Microtower memory frequency is clocked at 630 MHz. |
| **Storage** –<br>One or more of the following (see Storage section below) | **Diskette Drive**<br>1.44-MB Diskette Drive<br>**Media Reader**<br>HP 16-in-1 Media Reader and additional USB 2.0 port<br>**Optical Drives**<br>48X CD-ROM drive<br>48X/32X/48X CD-RW drive<br>16X/48X DVD-ROM drive<br>48X/32X Combo CD-RW/DVD-ROM Drive<br>16X DVD+/-RW LightScribe Drive (Double Layer/Dual Format) |
| **Keyboard** –<br>One of the following | HP PS/2 Standard Keyboard<br>HP USB Standard Keyboard |
| **Mouse** –<br>One of the following | PS/2 2-Button Scroll Mouse<br>PS/2 2-Button Optical Scroll Mouse<br>USB 2-Button Optical Scroll Mouse |
| **Audio** | Realtek ALC861 High Definition audio codec<br>3D audio compliant with AC'97 Rev. 2.3 and HD Audio compatible<br>Internal PC speaker |
| **Communication** | Intel PRO/1000 GT Gigabit PCI Adapter (full height)<br>Integrated Realtek 8100C Fast Ethernet Network Connection<br>Agere 56K PCI Modem |

*Available Technology and Features*

| | |
|---|---|
| Graphics | Integrated ATI graphics processor derived from the Radeon X300<br>ATI X300 PCI Express x16 Graphics Controller<br>ATI RADEON X1300 256MB DDR PCIe Graphics Controller |
| Miscellaneous | Adaptec FireConnect 2100 Firewire IEEE 1394 PCI Card (full height) |

*System Details*

| | | |
|---|---|---|
| **Base Unit** | • Micro ATX microtower chassis, including power supply and front bezel<br>• Five (5) drive bays and four expansion slots<br>• Microsoft operating system CD<br>• Active type heatsink<br>• 92 x 92 x 25 mm chassis fan<br>• System board with ATI Radeon Xpress 200 chipset, integrated Realtek 8100C Fast Ethernet 10/100 Network Connection, integrated graphics and audio, 2 PCI slots, 1 PCI Express x1 slot, 1 PCI Express x16 slot, 2 DDR2 DIMM memory slots<br>• (1) Parallel ATA data cable; 3-headed; supports two IDE drives<br>• (1) Serial ATA data cable<br>• Product documentation on CD<br>• HP system restore CD<br>• Power cord | |
| **Slots** | **PCI** | Two (2) full-height PCI 2.3 slots on PCA<br>One (1) full-height PCI Express x1 slot on PCA<br>One (1) full-height PCI Express x16 slot on PCA (for graphic cards) |
| | **Memory Expansion** | Two (2) DIMM slots (2 GB maximum memory support) |
| **Bays** | **Internal** | Two (2) 3.50" |
| | **External** | Two (2) 5.25"<br>One (1) 3.50" |
| **USB Support** | EHCI high-speed USB 2.0 controller<br>Two (2) front ports; Four (4) rear ports, Two (2) internal ports on motherboard | |
| **Interfaces** (Legacy) | One (1) parallel port<br>One (1) serial port<br>One (1) PS/2 keyboard port<br>One (1) PS/2 mouse port<br>One (1) analog VGA video port<br>One (1) line in; one (1) line out; one (1) mic in<br>One (1) RJ45 network port | |
| **Weight & Dimensions** | **Chassis Dimensions** (H x W x D) | 13.90 x 6.89 x 16.38 in (353 x 175 x 416 mm) |
| | **Packaged Dimensions** (L x W x H) | 22.25 x 19.63 x 16.31 in (565.15 x 498.5 x 414.3 mm) |
| | **System Weight** | 21.16 lb (9.6 kg) |
| | **Shipping Weight** | 30.86 lb (14.0 kg) |

*System Details*

| | | |
|---|---|---|
| Technology & Features | Memory Type | • PC2-5300 DDR2 SDRAM (667-MHz) non-ECC<br>• 2 GB maximum system memory<br><br>NOTE: The HP Compaq dx2200 Microtower memory frequency is clocked at 630 MHz. |
| | Hard Drive Interfaces Supported | • Serial ATA 1.5-Gb/s and 3.0-Gb/s hard drives are supported<br>• ATI Radeon Xpress 200 chipset limits throughput to 1.5 Gb/s |
| Intel Pentium 4 Processor with HT Technology | Coprocessor | Integrated |
| | CPU Socket Type/Number | Socket T<br>LGA775 socket |
| | CPU Package | LGA775 |
| | Front Side Bus Speed | 800-MHz |
| | Cache Memory | 1-MB L2 Advanced Transfer Cache (500 Series)<br>2-MB L2 Advanced Transfer Cache (600 Series) |
| Intel Celeron D Processor | Coprocessor | Integrated |
| | CPU Socket Type | Socket T<br>LGA775 socket |
| | CPU Package | LGA 775 |
| | Front Side Bus Speed | 533-MHz |
| | Cache Memory | 256-KB L2 Advanced Transfer Cache |
| Chassis | Front Panel | • Power button<br>• Power On LED<br>• HDD Activity LED |
| | Cooling Solutions Supported | • Power Supply Fan (variable speed)<br>• Aluminum active heatsink (variable speed)<br>• Chassis fan (variable speed) |
| | Slots Supported | Four (4) full-height expansion slots |
| | Front I/O | Two (2) USB 2.0 ports |
| | Rear I/O | Standard Micro ATX I/O connectors, including four (4 ) USB 2.0 ports |
| | Drive Bays | • Two (2) 5-1/4" external<br>• One (1) 3-1/2" external<br>• Two (2) 3-1/2" internal |
| | Internal Speaker | Standard |
| | Power Supply | 250-watt ATX Power Supply – PFC/non-PFC with a 115v/230v line switch (varies by country/region) |

*System Details*

**Unit Environment and Operating Conditions**

General Unit Operating Guidelines

- Keep the computer away from excessive moisture, direct moisture and the extremes of heat and cold, to ensure that unit is operated within the specified operating range.
- Leave a 4 in (10.2 cm) clearance on all vented sides of the computer to permit the required airflow.
- Never restrict airflow into the computer by blocking any vents or air intakes.
- Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air.
- Occasionally clean the air vents on the front, back, and any other vented side of the computer. Lint, dust and other foreign matter can block the vents and limit the airflow.
- If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply.

| | |
|---|---|
| Temperature Range | • Operating: 50° to 95° F (10° to 35° C)<br>• Non-operating: -22° to 140° F( -30° to 60° C) |
| Relative Humidity | • Operating: 10% to 90% (non-condensing at ambient)<br>• Non-operating: 5% to 95% (non-condensing at ambient) |
| Maximum Altitude (unpressurized) | • Operating: 10,000 ft (3048 m)<br>• Non-operating: 30,000 ft (9000 m) |

NOTE: Operating temperature is de-rated 1.0 deg C per 1000 ft (300 m) to 10,000 ft (3000 m) above sea level, no direct sustained sunlight. Maximum rate of change is 10 deg C/Hr. The upper limit may be limited by the type and number of options installed.

**System Board**

| | |
|---|---|
| Processor | • Socket T; LGA775 industry standard Micro ATX form factor<br>• Support single Intel Pentium 4 or Celeron D |
| PWM | • Intersil 6566 VRM 10.1 |
| Chipset | • ATI RC410 (Northbridge), ATI SB450 (Southbridge) |
| Super I/O | • W83627EHG |
| Front Side Bus Frequency | • 533/800 MHz |
| Memory | • DDR2 SDRAM<br>• 2 x DIMM slots<br><br>NOTE: The HP Compaq dx2200 Microtower memory frequency is clocked at 630 MHz. |
| Clock Generator | • RTM865 |
| Integrated Graphics | • Built-in ATI graphics processor derived from the Radeon X300 provided by the ATI Radeon Xpress 200 chipset |
| Audio | • Realtek ALC861 HD Audio compatible codec with two channel audio 3D audio compliant with AC'97 rev. 2.3 |
| LOM | • Realtek 8100c Fast Ethernet 10/100 |
| IDE | • Support all PIO modes<br>• 1 x IDE ports support up to 2 devices<br>• Support Ultra ATA 33/66/100 |
| Serial | • Two Serial ATA interfaces support data transfer rates up to 1.5 Gb/s |
| Expansion Slots | • 2 x PCI 2.3 slots<br>• 1 x PCI Express x1 slot<br>• 1 x PCI Express x16 slot |
| BIOS | • LPC EEPROM |

*System Details*

| | | |
|---|---|---|
| | Industrial Standard | • PCI 2.3 compliant<br>• USB 2.0 |
| | Rear Side I/O Ports | • 1 x PS/2 keyboard port<br>• 1 x PS/2 mouse port<br>• 4 x USB 2.0 ports<br>• 1 x RJ-45 10/100 port<br>• 1 x serial port<br>• 1 x parallel port<br>• 1 x DB 15 pin analog VGA port<br>• 3 x audio ports |
| | On Board I/O Interfaces | • 1 x ATX power connector<br>• 1 x +12V power connector<br>• 1 x Floppy connector<br>• 1 x Front panel connector, Switch, LED (ON/Flash/OFF)<br>• 2 x Fan headers for CPU, chassis, with voltage/fan speed control<br>• 1 x ATAPI headers-CD IN<br>• 1 x header to support 2 USB 2.0 ports at front side<br>• 1 x header to support USB media reader |
| | Board Size | • Micro-ATX, PCB Size: 9.6 x 9.0 in (24.38 x 22.86 cm)<br>• 4-layer PCB with green color |
| | Additional Features | • Bootable without keyboard, mouse or monitor<br>• Keyboard/mouse/USB wake up<br>• Support S1, S3, S4 and S5<br>• ACPI status<br>• Hardware monitor capability<br>• CPU fan speed control |
| Network Interface | | Integrated Realtek 8100C Fast Ethernet Network Controller |
| | Hardware Highlights | • PCI interfaces |
| | Features | • 10-Mbps and 100-Mbps operation |
| | | Intel PRO/1000 GT Gigabit PCI Adapter |
| | Hardware Highlights | • PCI interfaces |
| | Features | • 10-Mbps, 100-Mbps and 1000-Mbps operation |
| Wireless | | Wireless A+G PCI Card (full height bracket) |
| Power Supply | | • ATX Power Supply – Passive PFC/non-PFC with a 115v/230v line switch<br>• Passive Power Factor Correction (PFC) – with line switch set to 230V – No PFC in 115V line switch position<br>• 90 to 140VAC, or 180 to 264VAC operating voltage range<br>• 100 to 127VAC, or 200 to 240VAC rated voltage range<br>• 50–60 Hz rated line frequency<br>• 47–63 Hz operating line frequency range<br>• 250 watt maximum rated power<br>• 80-mm power supply fan – variable speed for optimum acoustics |

*System Details*

**Power Conservation 'Energy Saver'**

- Energy Star compliant
- APM 1.2 support
- Screen blanking
- Hard drive 'Idle' mode
- System Idle mode
- Blue Angel compliant (<5w in S5 – power off)
- ~2 watt power consumption in ES mode – suspend to RAM (S3) (instantly available PC)
- Processor/Cache memory power-down (S3)

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**System Environmental Specs**

- Values are subject to change without notification and are for reference only.
- Performance of system, options, and ancillary equipment will vary depending on the system configuration.
- Levels presented do not account for non-HP/Compaq installed hardware.

| | | |
|---|---|---|
| Ambient Air Temperature | Operating | 50° to 95°F (10° to 35°C) at sea level with an altitude de-rating of 1.0°C per every 1000 ft (300 m) above sea level to a maximum of 8000 ft (2500 m), no direct sustained sunlight. Maximum rate of change is 77°F/Hr (25°C/Hr). The upper limit may be limited by the type and number of options installed. |
| | Storage | -22° to 140°F (-30° to 60°C) – Maximum rate of change: 410°F/Hr (210°C/Hr). |
| Humidity | Operating | 10% to 90% relative humidity (Rh), 86°F (30°C) maximum wet bulb temperature, non-condensing |
| | Storage | 10% to 95% relative humidity (Rh), 101.66°F (38.7°C) maximum wet bulb temperature, non-condensing |
| Altitude | Operating | 0 to 10,000 feet (0 to 3048 meters) – This value may be limited by the type and number of options installed. Maximum allowable altitude change rate is 1,000 ft/min (304.8 m/min). |
| | Non-Operating | 0 to 30,000 feet (0 to 9,144 meters) – Maximum allowable altitude change rate is 1200 ft/min (365.76 m/min). |
| Shock | Listed are the levels of shock the product can withstand with NO damage being incurred. The values represent peak input acceleration during an 2~3 ms half-sine shock pulse, 11 ms trapezoidal shock pulse. | |
| | Non-Operating | 35G's (Half-sine Shock)<br>35G's (Trapezoidal Shock) |
| Vibration | Listed are the levels of vibration the product can withstand with NO damage being incurred. The values represent a flat random vibration input acceleration profile across the given frequency range. | |
| | Operating | Random vibration at 5Hz@0.00025$G^2$/Hz, 10Hz@0.01$G^2$/Hz, 100Hz@0.01$G^2$/Hz, 300Hz@0.00001$G^2$/Hz<br>5Hz to 300Hz, (0.25G's nominal). |
| | Non-Operating | Random vibration at 0.008$G^2$/Hz,<br>10Hz to 500Hz, (2 Grms nominal). |

**Acoustic Noise**

Listed are the declared A-WEIGHTED SOUND POWER LEVELS (LWAd) and declared average desktop seated operator position A-WEIGHTED SOUND PRESSURE LEVELS (LpAm) when the product is operating in a 73.4°F (23°C) ambient environment. Noise emissions were measured in accordance with ISO 7779 (ECMA 74) and declared in accordance with ISO 9296 (ECMA 109).

| | |
|---|---|
| **IDLE** (Fixed disk drive spinning) | LWAd = 4.3 Bels,<br>Desktop Average LpAm = 32 dBA |
| **FIXED DISK** (Random write) | LWAd = 4.8 Bels,<br>Desktop Average LpAm = 37dBA |
| **CD-ROM** (Sequential Reads) | LWAd = 5.0 Bels,<br>Deskside Average LpAm = 39dBA |

**Service and Support**

On-site Warranty[Note 1]: One-year (1-1-1) limited warranty delivers one year of on-site, next business-day[Note 2] service for parts and labor and includes free telephone support[Note 3] 24 x 7. Global coverage[Note 2] ensures that any product purchased in one country and transferred to another non-restricted country will remain fully covered under the original warranty and service offering. One-year onsite and labor are not available in all countries.

NOTE 1: Certain restrictions and exclusions apply.

NOTE 2: On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider. Global service response times are based on commercially reasonable best effort and may vary by country.

NOTE 3: Technical telephone support applies only to HP-configured Compaq and third-party HP-qualified hardware and software.

*After-Market Options*

| | | |
|---|---|---|
| Communications | **NICs** | |
| | Intel PRO/1000 GT Gigabit PCI Adapter (full height) | AG393AA |
| | **Wireless LAN** | |
| | HP Wireless A+G PCI Card | EA118AA |
| | **Modems** | |
| | Agere 2006 PCI High-Speed 56K International SoftModem | EK694AA |
| Hard Disk Drives | HP 250-GB SATA 3.0-Gb/s Hard Drive | PY278AA |
| | HP 160-GB SATA 3.0-Gb/s Hard Drive | PY277AA |
| | HP 80-GB SATA 3.0-Gb/s Hard Drive | PY276AA |
| Removable Storage Devices | **Diskette Drive** | |
| | HP 1.44-MB Internal Diskette Drive | AG295AA |
| | HP 1.44-MB USB Diskette Drive – External | DC141B |
| | 16-in-1 Media Reader | EM718AA |
| | **USB Drive Key** | |
| | HP 1-GB Drive Key II Flash Drive | AG382AA |
| | HP 512-MB Drive Key II Flash Drive | ED516AA |
| | **Removable StorCase** | |
| | StorCase Removable Hard Drive Enclosure | EA332AA |
| | Spare Carrier for StorCase Removable Hard Drive Enclosure (EA332AA) | RA697AA |
| Input Devices | **Keyboards** | |
| | HP PS/2 Standard Keyboard | DT527A#ABA |
| | HP USB Standard Keyboard | DT528A#ABA |
| | **Mice** | |
| | HP PS/2 2-Button Scroll Mouse | DD440B |
| | HP PS/2 2-Button Optical Scroll Mouse | EY703AA |
| | HP USB 2-Button Optical Scroll Mouse | DC172B |
| Memory | HP 1-GB PC2-5300 (DDR2-667 MHz) DIMM | PX976AA |
| | HP 512-MB PC2-5300 (DDR2-667 MHz) DIMM | PX975AA |
| | HP 256-MB PC2-5300 (DDR2-667 MHz) DIMM | PX974AA |
| | NOTE: The HP Compaq dx2200 Microtower memory frequency is clocked at 630 MHz. | |
| Audio | HP Satellite Speakers | ZD929AA#ABA |
| Graphics | ATI Radeon X300 SE 128MB DDR PCIE DVI w/TV | DY596A |
| | ATI RADEON X1300 256MB DDR PCIE DVI w/TV | AG392AA |

*After-Market Options*

| | | |
|---|---|---|
| **Optical Drives** | HP 48X Max CD-ROM Drive | DC143B |
| | HP 48X/32X/48X CD-RW Drive | DL975B |
| | HP 48X CD-RW/DVD-ROM Combo Drive | DL976B |
| | HP 16X/48X DVD-ROM Drive | PR596A |
| | HP 16X DVD+/-RW LightScribe Drive | PR595A |
| **Miscellaneous** | Adaptec FireConnect 2100 Firewire (1394) PCI Card | PA997A |
| | Belkin 7-outlet Surge Protector | AG290AA#ABA |
| | USB to Serial Adapter, 3ft | EM449AA |
| | USB Gold Series A/B Device Cable | AH121AA |
| | Cat5e Patch Cable | AH122AA |
| | Firewire (1394) Cable | AH123AA |
| **Chassis Enhancements** | 5.25" Blank Bezel Kit (Carbonite 50/Bulk Pack) | DC177B |
| **Monitors** | **CRTs** | |
| | HP s7540 17" (16.0" vis) CRT Monitor | PF997AA#ABA |
| | HP v7650 17" (16.0" vis) Flat-face CRT Monitor | PF996AA#ABA |
| | **TFTs** | |
| | HP L1506 15" TFT Flat Panel Monitor – Analog only | PX848AA#ABA |
| | HP L1706 17" TFT Flat Panel Monitor – Analog only | PX849AA#ABA |
| | HP L1740 17" TFT Flat Panel Display – Analog/Digital | PL766AA#ABA |
| | HP L1755 17" TFT Flat Panel Display – Analog/Digital | PL777AA#ABA |
| | HP L1906 19" TFT Flat Panel Display – Analog only | PX850AA#ABA |
| | HP L1940T 19" TFT Flat Panel Display – Analog/Digital | EM869AA#ABA |
| | HP L1955 19" TFT Flat Panel Display – Analog/Digital | PD974AA#ABA |
| | HP L2065 20" TFT Flat Panel Display – Analog/Digital | EF227A4#ABA |
| | HP LP2465 24" TFT Widescreen Flat Panel Display – Analog/Digital | EF224A4#ABA |
| | HP L5006tm 15" Touch Screen Flat Panel Display | RB146AA#ABA |
| | **GSA Monitors** | |
| | HP L717g 17" GSA Flat Panel Monitor | EE191AA#ABA |
| | HP L919g 19" GSA Flat Panel Monitor | EE192AA#ABA |
| | **Options** | |
| | HP Flat Panel Speaker Bar | EE418AA |
| | HP CRT Monitor Multimedia Base | PM552AA |

*Memory*

### DDR SYNCH DRAM NON-ECC MEMORY

The ATI Radeon Xpress 200 chipset supports non-ECC DDR2 memory up to PC2-5300 (667-MHz). Memory upgrades are accomplished by adding single or multiple DIMMs of the same or varied sizes. This chart does not represent all possible memory configurations.

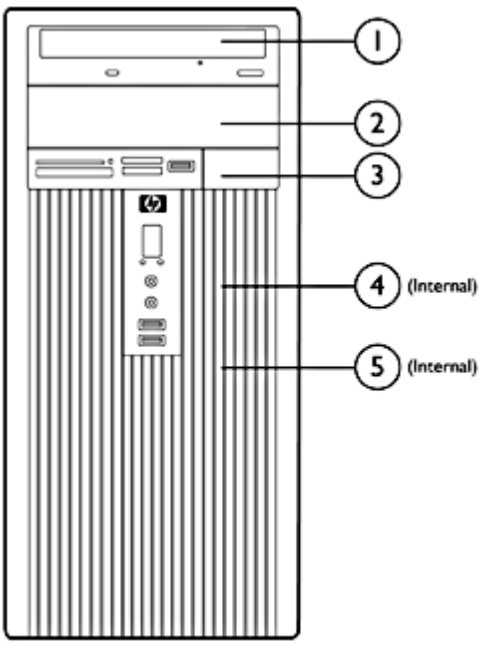
NOTE: The HP Compaq dx2200 Microtower maximum memory frequency is clocked at 630 MHz.

### MAXIMUM MEMORY

Supports up to 2-GB of DDR2 SYNCH DRAM. Not all memory configurations possible are represented below.

| DIMM Size | Slot 1 | Slot 2 |
|---|---|---|
| 256-MB | 256-MB | |
| 512-MB | 512-MB | |
| 512-MB | 256-MB | 256-MB |
| 1-GB | 1-GB | |
| 1-GB | 512-MB | 512-MB |
| 2-GB | 1-GB | 1-GB |

*Storage*




## HP Compaq dx2200 Microtower Business PC

| | Maximum Quantity Supported | Position Supported | Controller |
|---|---|---|---|
| **Drive Support** | | | |
| Diskette Drives | 1 | 3 | SIO |
| Media Reader | 1 | 3 | Internal USB 2.0 port |
| CD-ROM Drives | 2 | 1, 2 | IDE ATAPI |
| DVD-ROM Drives | 2 | 1, 2 | IDE ATAPI |
| CD-RW/Combo Drives | 2 | 1, 2 | IDE ATAPI |
| DVD+/-RW Drives | 2 | 1, 2 | IDE ATAPI |
| 3.5" Serial ATA Hard Drives | 2 | 4,5 | SATA |

*Technical Specifications - Audio*

| | | |
|---|---|---|
| Integrated Realtek ALC861 Audio | Type | Integrated |
| | HD Audio compatible codec | Yes |
| | Sampling | Supports 48/96 KHz |
| | Audio Jacks | Mic-In |
| | | Line-In |
| | | Line-Out / Headphone Out |
| | Power Support | Digital: 3.3V |
| | | Analog: 5V |
| | Other | Meets performance requirements for audio on PC99/2001 systems<br>High quality differential CD input |

| | | |
|---|---|---|
| **Intel PRO/1000 GT Gigabit PCI NIC** | **Connector** | RJ-45 |
| | **Controller** | Intel 82541PI Gigabit Controller |
| | **Memory** | Integrated 64KB configurable transmit receive buffer memory |
| | **Data rates supported** | 10/100/1000 Mbps |
| | **Compliance** | IEEE 802.1P, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control |
| | **Bus architecture** | PCI 2.3 |
| | **Data path width** | 32-bit, 33/66 MHz bus interface |
| | **Data transfer mode** | Bus-master DMA |
| | **Hardware certifications** | FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union |
| | **Power requirement** | (800mA) 4watts @ +5VDC |
| | **Boot ROM support** | Yes |
| | **Network transfer rate** | 10BASE-T (half-duplex) 10 Mbps |
| | | 10BASE-T (full-duplex) 20 Mbps |
| | | 100BASE-TX (half-duplex) 100 Mbps |
| | | 100BASE-TX (full-duplex) 200 Mbps |
| | | 1000BASE-T (full-duplex) 2000 Mbps (actual rate limited by PCI Bus) |
| | **Environmental** | **Operating temperature** 32° to 131°F (0° to 55° C) |
| | | **Operating humidity** 85% at 131° F (55° C) |
| | **Dimensions** | 6.4 x 4.8 x 0.8 in (16.3 x 12.1 x 1.9 cm) |
| | **Operating system driver support** | Microsoft Windows NT 4.0, Microsoft Windows 98, SE, Me, Microsoft 2000, Microsoft XP, Linux 2.2, Linux 2.4 |
| | **Management capabilities** | ACPI, WOL and DMI 2.0, S5 WOL, WMI, PXE 2.0, RPL |
| **HP Wireless A+G PCI** | **Dimensions** | 4.99 x 2.54 x 0.71 in (126.8 x 64.4 x 18.0 mm) |
| | **Weight** | 0.268 lb (65 g) |
| | **Controller system interface** | Atheros AR5414X chipset<br>PCI Spec 2.2 |
| | **Network standard** | IEEE 802.11a/b/g |
| | **Frequency band** | 5.1500 to 5.8500 GHz |
| | | 2.4000 to 2.4835 GHz |
| | | 2.4465 to 2.4835 GHz (Europe, Middle East, Asia and Asia Pacific – excluding Japan) |
| | | 2.4000 to 2.4697 GHz (Japan) |
| | **Operating temperature** | 32° to 140° F (0° to 60° C), operating |
| | **Storage temperature** | -4° to 176° F (-20° to 80° C), non-operating |
| | **Humidity** | 10% to 85% non-condensing |
| | **Operating voltage** | 5V ± 5% |
| | **Power consumption** | Tx/Rx peak 560/250mA @ 3.3V (max.) |
| | **Output power** (approximately) | 15 dBM ±2dB |
| | **Receive sensitivity** | -90dBm at 11 Mbps (typical) |

*Technical Specifications - Communications*

| | | |
|---|---|---|
| | Data transfer rate | Standard rates of 1, 2, 5.5, 11, 6, 9, 12, 18, 24, 48, 54 and Super AG Mode108-Mbps |
| | Spreading | DSSS (Direct Sequence Spread Spectrum) |
| | Security | 64(40h) bit, 128(104h) bit, WPA, IEEE802.1X, AES-OCB, AES-CCM, Microsoft PEAP,TKIP, WEP |
| | Antenna | External 5dBi antenna |
| | Throughput | **108 Mbps** (only with Belkin 54G or above router that supports 108 Mbps speed) — 200 ft (60.96 m) – Indoor |
| | | **54 Mbps** — 200 ft (60.96 m) – Indoor |
| | | **11 Mbps** — 200 ft (60.96 m) – Indoor |
| | Certifications | Wi-Fi certified |
| | Certifications for use by country | North America: United States, Canada |
| | | Europe: Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom Australia |
| | | New Zealand |
| | OS support | Microsoft Windows XP Professional and Home |
| | | Microsoft Windows 2000 |
| Agere 56K PCI Modem | Data Transmission | 56,000 Kbps maximum downstream data |
| | | NOTE: 56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions. |
| | Data Speeds | (Upload only) 33,600/31,200/28,800/26,400/21,600/19,200/16,800/14,400/ 12,000/9,600/7,200/4,800/2,400/1,200/300 |
| | Data Standards | ITU-T V.90, ITU-T, ITU-T V.34, V.44, V.42, V.42bis21, V.32bis, Bell 212A, and Bell 103 |
| | Fax Speeds | 14,400/12,000/9,600/7,200/4,800/2,400/300 b/s |
| | Fax Mode Capabilities | ITU-T T.31 class 1 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2 |
| | Error Correction and Data Compression | V.44, 42bis, V.42 and MNP2-5 |
| | Power Management | ACPI; PPMI 1.1 and wake support with PME and Vaux; meets PCI 2.3 requirements and PC 2001 requirements |
| | Upgradeability | Driver upgradeable for future enhancements |
| | Video | ITU-T V.80 video ready interface |
| | Other | TIA/EIA 602 standard AT command set |
| | | Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface |
| | | Optional ring wakeup signal |
| | Operating Temperature | 32° to 158° F (0° to 70° C) |
| | Operating Humidity | 20% to 90%, non-condensing |

*Technical Specifications - Communications*

| | |
|---|---|
| Operating System Support | Microsoft Windows XP |
| OS Driver Support | Microsoft Windows XP |
| Power | Requires a 3.3-V auxiliary power rail on PCI bus |
| | Uses only one PCI load (i.e., one grant/request pair), one shared IRQ, one electrical load |
| Chipset | Agere Systems SV92PL – Integrated PCI interface with 5-V tolerant buffers and CardBus support |
| Dimensions (L X H) | Complies with PCI low profile specifications-6.7 x 2.3 in (17.0 x 5.8 cm) and supports high- and low-profile brackets |
| Connection | Single RJ-11 connector |
| Other Features | Digital line protection, call progress monitoring via on-board piezo device, support for high profile and low profile brackets, PnP ID support |
| Safety | UL recognized to UL 1950, 3rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark |
| EMC | FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8 |
| Telecom | FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals<br>Not available in Korea or the Republic of South Africa. |
| Health | Bare PCB material compliant to 94V-0 or better (marked as such) |
| Other | PC 2001 compliant, PCI version 2.3, WHQL approved; ACPI compliant |

| | | |
|---|---|---|
| ATI built-in graphics processor provided by the Radeon Xpress 200 chipset | 3D Graphics | • Full DirectX 9.0 Support (Vertex Shader v2.0 and Pixel Shader v2.0)<br>• Supports resolutions up to 2048 x 1536 @ 32 bpp<br>• SMARTSHADER™ 2.0 allows for complex, movie-like 3D effects<br>• SMOOTHVISION™ 2.1 improves image quality through anti-aliasing using multi-sampling algorithm with support for 2, 4 and 6 samples |
| | Bus Type | PCI Express™ x16 for optional graphics upgrade |
| | Memory | HYPERMEMORY™ technology offers optional dedicated Local Frame Buffer configuration for a 32-bit or 64-bit interface and up to 128MB of memory. UMA mode operation uses from 32MB up to 256MB of shared system memory. |
| | Operating Systems | Microsoft Windows XP |

| | | |
|---|---|---|
| ATI RADEON X1300 PCIe Graphics Card (256 MB) | Bus type | PCI Express (x16 lanes) |
| | Maximum vertical refresh rate | 85 Hz |
| | Display support | Integrated 400 MHz RAMDAC |
| | Display max resolution | 2048 x 1536 |
| | Board display options | DVI-I + TV<br>DVI-I supports analog CRT or flat panel or digital flat panel (using DVI-A, DVI-D or DVI-I connector)<br>DVI-I supports analog CRT or flat panel (with VGA connector and DVI-I to VGA dongle)<br>TV connector is a 4-pin mini-DIN S-video connector |
| | Board configuration | Specification: Description<br>Graphics Chip: RV515<br>Core clock: 450 MHz<br>Memory clock: 250 MHz<br>Frame buffer: 256 MB DDR2 |
| | Languages supported | 24 languages: English, Arabic, Chinese Simplified, Chinese Traditional, Czechoslovakian, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish, Thai, Turkish |
| | Operating systems support | Windows 2000, Windows XP, Linux x86 and x86_64 distributions using XFree86 or X.Org*.<br><br>*Linux drivers are available from ATI's website and may be available in a Linux distribution. Refer to the Open Source and Linux from HP website (http://www.hp.com/wwsolutions/linux/products/clients/) for support information. |
| | Core power | 25 W (Max board power) |
| | Option kit contents | • ATI RADEON X1300 PCIe graphics card with full height bracket attached<br>• Low profile bracket<br>• DVI-to-VGA Adapter<br>• Software CD with graphics drivers<br>• Warranty documentation |

| | |
|---|---|
| Compliance standards | EMC Emissions:<br>a) FCC Part 15, Subpart B – Unintentional Radiators, Class B Computing Devices for Home & Office Use<br>b) CISPR22: 1997/EN 55022:1998 – Class B – Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment<br>c) Canadian Standard ICES-003 is equivalent to CISPR22<br>d) Taiwanese Standard BSMI<br>e) Japanese VCCI<br>f) Australian C-Tick<br><br>EMC Immunity:<br>CISPR 24:1997/EN 55024:1998 – Information Technology Equipment – Immunity Characteristics – Limits and Methods of Measurement.<br><br>Safety:<br>UL 60950 (USA) & EN 60950 (EU): Safety of Information Technology Equipment, Including Electrical Business Equipment. All boards meet UL PCB flammability requirements. |

| | | | |
|---|---|---|---|
| HP PS/2 or USB Standard Keyboard | Physical characteristics | Keys | 104, 105, 106, 107, 109 layout (depending upon country) |
| | | Dimensions (L x W x H) | 18.0 x 6.4 x 0.98 in (45.8 x 16.3 x 2.5 cm) |
| | | Weight | 2 lb (0.9 kg) minimum |
| | Electrical | Operating voltage | + 5VDC ± 5% |
| | | Power consumption | 50-mA maximum (with three LEDs ON) |
| | | ESD | CE level 4, 15-kV air discharge |
| | | EMI – RFI | Conforms to FCC rules for a Class B computing device |
| | | MicrosoftPC 99 – 2001 | Functionally compliant |
| | Mechanical | Languages | 38 available |
| | | Keycaps | Low-profile design |
| | | Switch actuation | 55-g nominal peak force with tactile feedback |
| | | Switch life | 20 million keystrokes (using Hasco modified tester) |
| | | Switch type | Contamination-resistant switch membrane |
| | | Key-leveling mechanisms | For all double-wide and greater-length keys |
| | | Cable length | 6 ft (1.8 m) |
| | | Microsoft PC 99 – 2001 | Mechanically compliant |
| | | Acoustics | 43-dBA maximum sound pressure level |
| | Environmental | Operating temperature | 50° to 122° F (10° to 50° C) |
| | | Non-operating temperature | -22° to 140° F (-30° to 60° C) |
| | | Operating humidity | 10% to 90% (non-condensing at ambient) |
| | | Non-operating humidity | 20% to 80% (non-condensing at ambient) |
| | | Operating shock | 40 g, six surfaces |
| | | Non-operating shock | 80 g, six surfaces |
| | | Operating vibration | 2-g peak acceleration |
| | | Non-operating vibration | 4-g peak acceleration |
| | | Drop (out of box) | 26 in (66 cm) on carpet, six-drop sequence |
| | | Drop (in box) | 42 in (107 cm) on concrete, 16-drop sequence |
| | Operating system support | Microsoft Windows XP Professional, Microsoft Windows XP Professional x64 Edition, Red Hat Enterprise Linux Workstation 3 | |
| | Approvals | UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BSMI, C-Tick, MIC | |
| | Ergonomic compliance | ANSI HFS 100, ISO 9241-4, and TUVGS | |

*Technical Specifications - Input/Output Devices*

| | | | |
|---|---|---|---|
| HP 2-Button Scroll Mouse (PS/2 or USB) | Scroll Wheel | 8 mm | |
| | Maximum Rotation Speed | 30 mm/s | |
| | Switch Type | Light force micro-switch | |
| | Switch Life | 1 million operations | |
| | Mechanical Life | Minimum 200,000 revolutions | |
| | Environmental | Operating Temperature | 50° to 122° F (10° to 50° C) |
| | | Non-operating Temperature | -22° to 140° F (-30° to 60° C) |
| | | Operating Humidity | 10% to 90% (non condensing at ambient) |
| | | Non-operating Humidity | 20% to 80% (non condensing at ambient) |
| | | Operating Shock | 40 g, 6 surfaces |
| | | Non-operating Shock | 80 g, 6 surfaces |
| | | Operating Vibration | 2 g peak acceleration |
| | | Non-operating Vibration | 4 g peak acceleration |
| | Electrical | Operating Voltage | + 5VDC ± 10% |
| | | Power Consumption | 15mA |
| | | System Consumption | PS/2 mini-din connector |
| | | ESD | CE level 4, 15 kV air discharge |
| | | EMI-RFI | Conforms to FCC rules for a Class B computing device |
| | | PC98 | Functionally compliant |
| | Mechanical | Resolution | 400 ± 20% DPI |
| | | Tracking Speed | 10 in/s maximum |
| | | Acceleration | 100 in/s |
| | | Switch Actuation | 85 g nominal peak force |
| | | Switch Life | 1,000,000 operations (using Hasco modified tester) |
| | | Cable Length | 2 m |
| | | PC98-99 | Mechanically compliant |
| | Regulatory Approvals | UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BCIQ, C-Tick | |

*Technical Specifications - Hard Drives*

| | | | | |
|---|---|---|---|---|
| Serial ATA Hard Drives (7200 rpm) | 40 GB | Capacity | 40,020,664,320 bytes | |
| | | Height | 1 in (2.6 cm) | |
| | | Width | Media diameter: 3.5 in (8.9 cm)<br>Physical size: 4 in (10.2 cm) | |
| | | Interface | Serial ATA | |
| | | Synchronous Transfer Rate (Maximum) | 1.5 Gb/s | |
| | | Buffer | 2 MB | |
| | | Seek Time (typical reads, includes controller overhead, including settling) | Single Track | 1.0 ms |
| | | | Average | 8.5 ms |
| | | | Full-Stroke | 18 ms |
| | | Rotational Speed | 7,200 rpm | |
| | | Logical Blocks | 78,165,360 | |
| | | Operating Temperature | 32° to 140° F (0° to 60° C) | |
| | 80 GB* | Capacity | 80,026,361,856 bytes | |
| | | Height | 1 in (2.6 cm) | |
| | | Width | Media diameter: 3.5 in (8.9 cm)<br>Physical size: 4 in (10.2 cm) | |
| | | Interface | Serial ATA | |
| | | Synchronous Transfer Rate (Maximum) | 1.5 Gb/s | |
| | | Buffer | 8 MB | |
| | | Seek Time (typical reads, includes controller overhead, including settling) | Single Track | 1.0 ms |
| | | | Average | 8.5 ms |
| | | | Full-Stroke | 18 ms |
| | | Rotational Speed | 7,200 rpm | |
| | | Logical Blocks | 156,301,488 | |
| | | Operating Temperature | 32° to 140° F (0° to 60° C) | |

*Technical Specifications - Hard Drives*

| | | | |
|---|---|---|---|
| 160 GB* | Capacity | 160,041,885,696 bytes | |
| | Height | 1 in (2.6 cm) | |
| | Width | Media diameter: 3.5 in (8.9 cm)<br>Physical size: 4 in (10.2 cm) | |
| | Interface | Serial ATA | |
| | Synchronous Transfer Rate (Maximum) | 1.5 Gb/s | |
| | Buffer | 8 MB | |
| | Seek Time (typical reads, includes controller overhead, including settling) | Single Track | 1.0 ms |
| | | Average | 8.5 ms |
| | | Full-Stroke | 18 ms |
| | Rotational Speed | 7,200 rpm | |
| | Logical Blocks | 312,581,808 | |
| | Operating Temperature | 32° to 140° F (0° to 60° C) | |
| 250 GB* | Capacity | 250,059,350,016 bytes | |
| | Height | 1 in (2.6 cm) | |
| | Width | Media diameter: 3.5 in (8.9 cm)<br>Physical size: 4 in (10.2 cm) | |
| | Interface | Serial ATA | |
| | Synchronous Transfer Rate (Maximum) | 1.5 Gb/s | |
| | Buffer | 8 MB | |
| | Seek Time (typical reads, includes controller overhead, including settling) | Single Track | 0.8 ms |
| | | Average | <9.0 ms |
| | | Full-Stroke | =17 ms |
| | Rotational Speed | 7,200 rpm | |
| | Logical Blocks | 488,397,168 | |
| | Operating Temperature | 41° to 131° F (5° to 55° C) | |

NOTE: Although this drive is rated for a 3.0-Gb/s transfer rate, the Serial ATA interfaces in the HP Compaq dx2200 Microtower support data transfer rates up to 1.5 Gb/s.

*Technical Specifications - Optical Storage*

| | | | |
|---|---|---|---|
| 48X CD-ROM Drive | Interface | ATAPI | |
| | Data Transfer Rate | Variable (Audio CD) – 1,800 to 3,600 KB/s (24X) Max | Variable (CD-ROM, CD-R) – 2,400 to 7,200 KB/s (48x) Max |
| | Access Time (ms) | Random: <125 ms | Full-stroke seek: <210 ms |
| | Data Buffer | 2MB | |
| | Disk Formats Read | CD-ROM Mode 1, CD-ROM XA (Mode 2, Form 1 and 2), CD Digital Audio, CD-EXTRA, CD-I (Mode 2, Form 1 and 2) and CD-I Ready, CD-Text, CD-Bridge, Photo CD (Single and Multi Session), Video CD, CD-R and CD-RW Multi-Session | |
| | Disk Formats Written | None | |
| | Disk Capacity (CD) | 180 MB, 540 MB, 650 MB, and 70 0MB | |
| | Block Size | Mode 1-2,048, 2,352 bytes<br>Mode 2-1, 2,048, 2,328, 2,336, 2,340, 2,353 bytes<br>Mode 2-2, 2,328, 2,336, 2,340, 2,352 bytes<br>CD-DA-2,352, 2,368 bytes | |
| | Diameter | 12 cm; 8 cm | |
| | Thickness | 1.2 mm | |
| | Track Pitch | 1.6 $\mu$m | |
| | Audio Output Level | Line-out – 0.7 V @ 47 Kohm | Headphone – 0.6 V @ 32 ohm |
| | Startup Time | <7 seconds (typical); < 30 seconds with multi-session | |
| | Operating Conditions | Temperature | 41° to 122° F (5° to 50° C) |
| | | Relative Humidity | 10% to 90% |
| | Dimensions (H x W x D, maximum) | 1.7 x 5.9 x 8.0 in (4.3 x 15.0 x 20.3 cm) | |
| | Weight | 2.6 lb (1200 g) | |
| | Operating Systems Supported | Microsoft Windows XP Professional | |

| | | |
|---|---|---|
| 48X/32X/48X CD-RW Drive | Orientation | Either horizontal or vertical |
| | Disc loading mechanism | Half-height, tray load |
| | Interface type | ATAPI IDE |
| | Dimensions-external (W x H x D) | 7.99 x 5.88 x 1.71 in (20.3 x 14.93 x 4.34 cm) |
| | Weight | 2.6 lb (1.2 kg) |
| | Disc diameter | 12 cm, 8 cm |
| | Disc thickness | 1.2 mm |
| | Track pitch | 1.6 $\mu$m |
| | Disc center hole diameter | 15 mm |
| | Reference scanning velocity | 1.2 m/s |
| | Recording/playing time | 80 minutes with CD-R media |

| | | |
|---|---|---|
| Read only disc parameters | Formats and modes supported | CD-ROM-Mode 1; CD-ROM XA-Mode 2 (forms 1 and 2); CD digital audio; CD Extra; CD-I-Mode 2 (forms 1 and 2) and CD-I-Ready; Photo CD (single and multi-session); video CD |
| | Capacity | 185 MB (Mode 2, 8cm); 540 MB (Mode 1, 12 cm); 650 MB (Mode 2, 12 cm); 700 MB (Mode 2, 12 cm) |
| | Block size | Mode 1-2,048 and 2,352 bytes; mode 2, form 1-2,048; 2,328; 2,336; 2,340 and 2,352 bytes; mode 2, form 2-2,328; 2,336; 2,340 and 2,352 bytes; CD-DA-2,352 and 2,368 bytes |
| Writeable disc parameters | Disc type | CD-R and CD-RW |
| | Write methods | Disc at Once, Track at Once, Session at Once, Variable Packet, Fixed Packet |
| | Format and modes supported | CD-ROM (mode 1); CD-ROM XA (mode 2, forms 1 and 2); CD digital audio, CD-I (mode 2, forms 1 and 2); video CD |
| | Capacity | 185 MB (Mode 2, 8cm); 540 MB (Mode 1, 12 cm);<br>650 MB (Mode 2, 12 cm); 700 MB (Mode 2, 12 cm) |
| | Block size | Mode 1-2,048 bytes; mode 2, form 1-2,048 and 2,352 bytes;<br>mode 2, form 2-2,352 bytes; CD-DA ---2,352 bytes |
| Access times (typical) | Random | < 120 ms |
| | Full stroke | < 200 ms |
| Data transfer rates | CD-RW write | 4800 KB/s (up to 32X) |
| | CD-ROM, CD-R read | 7200 KB/s (up to 48X) |
| | CD-RW read | 7200 KB/s (up to 32X) |
| | CD-R write | 7200 KB/s (up to 48X) |
| Data transfer modes | ATA PIO mode 4 (16.7MB/s); ATA multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA mode 0 (16.7 MB/s); ATA UltraDMA mode 1 (24 MB/s); ATA UltraDMA mode 2 (33 MB/s) – default. | |
| Cache buffer | 2 MB (minimum) | |
| Start-up time (single) | < 7 seconds typical | |
| Start-up time (multi-session) | < 30 seconds typical | |
| Stop time | < 4 seconds | |

*Technical Specifications - Optical Storage*

| | | | |
|---|---|---|---|
| Power | Source | Four-pin, DC power receptacle | |
| | DC power requirement | 5 VDC 5%-100 mV ripple p-p | |
| | | 12 VDC 5%-200 mV ripple p-p | |
| | DC current | 5 VCD | < 1A (typical) |
| | | | < 1600 mA (maximum) |
| | | 12 VCD | < 600 mA (typical) |
| | | | < 1.4A (maximum) |
| | | Total Drive Power (Standby mode) | < 2.5 watt |
| Audio output level | 0.7 Vrms | | |
| Configuration jumper block | Master, slave and cable select modes | | |
| Data interface connector | 50-pin IDE interface | | |
| Environmental (all conditions, non-condensing) | Temperature (operating) | 41° to 122° F (5° to 50° C) | |
| | Relative Humidity (operating) | 10% to 90% | |
| | Maximum Wet Bulb Temperature (operating) | 84° F (29° C) | |
| Certifications, requirements | ACA AS/NZS 3548, ANSI C63.4-1992, CB Test Certificate for IEC 950, CE Mark, CFR 47 part 15, CNS 13438, CSA C22.2 No. 60950, DHHS/FDA - 1040, EN60825, EN55022:1998, EN55024, EN60 950:2000, ICES-003 class B, IEC 61000 4-2 - 4-11, Nordic EN60 950, TUV or VDE EN60 950, UL 60950, C.I.S.P.R. Publication 22 Class B, BSMI, Microsoft P2001, Microsoft Logo for Windows 98, 2000 and XP | | |
| Operating systems supported | Microsoft Windows XP | | |

| | | |
|---|---|---|
| 16X/48X DVD-ROM Drive | Height | 5.25-in, half-height |
| | Interface Type | ATAPI |
| | Dimensions – External, Excluding Bezel (W x H) | 5.88 x 1.71 in (149.5 x 43.5 mm) |
| | Disc Diameter | 12 cm, 8 cm |
| | Disc Thickness | 1.2 mm |
| | Track Pitch | 1.6 μm (CD), 0.74 μm (DVD) |
| | Disc Center Hole Diameter | 15 mm |
| | Disc Formats | DVD-ROM (single and dual layer); DVD-video; DVD-R version 1.0 and 2.0; DVD-RW version 1.0 and 1.1; DVD-R multi-border; DVD+RW; DVD+R, DVD+R DL ; CD-ROM Mode 1 and 2; CD-DA; CD-ROM XA Mode 2, Form 1 and 2; CD-extra; CD-text; CD-I Mode 2, Form 1 and 2; CD-I ready; video CD, CD-bridge; PhotoCD (single and multi-session); CD-R; CD-RW |

*Technical Specifications - Optical Storage*

| | | | |
|---|---|---|---|
| | Disc Capacity | DVD-ROM | 4.7 GB (DVD-5), 8.54 GB (DVD-9), 9.4 GB (DVD-10), 3.95 GB (DVD-R version 1.0), 4.7 GB (DVD-R version 2.0), 4.7 GB (DVD-RW version 1.0 and 1.1), 4.7 GB (DVD+RW), 4.7G (DVD+R), 8.5 GB (DVD+R DL) |
| | | CD-ROM | 540 MB (Mode 1, 12 cm), 640 MB (Mode 2, 12 cm), 700 MB (80 minimum CD-R and CD-RW), 180 MB (8 cm) |
| | Block Size (bytes) | DVD-ROM – 2048; CD-ROM Mode 0 – 2352; CD-ROM Mode 1 – 2352, 2340, 2336, 2048; CD-ROM Mode 2 – 2352, 2340, 2336, 2048 | |
| | Access Times (typical reads, including settling) | DVD-ROM Single Layer | 120 ms (typical) |
| | | CD-ROM Mode 1 | 90 ms (typical) |
| | | Full Stroke DVD | 240 ms (seek) (typical) |
| | | Full Stroke CD | 160 ms (seek) (typical) |
| | Maximum Data Transfer Rates | CD-ROM Read | 7200 KB/s (up to 48X) |
| | | DVD-ROM Read | 21,600 KB/s (16X) Max |
| | Data Transfer Modes | PIO Mode 4 (16.6 MB/s); Multi-word DMA mode 2 (16.6 MB/s); UltraDMA Mode 3 (44.4 MB/s) | |
| | Power | Source | Four-pin, DC power receptacle |
| | | DC Power Requirement | 5 VDC ± 5% – 100 mV ripple p-p |
| | | | 12 VDC ± 5% – 200 mV ripple p-p |
| | | DC Current | 5 VDC – <800 mA typical, < 1000 mA maximum |
| | | | 12 VDC – < 870 mA typical |
| | Audio Output Level | 0.7 Vrms (typical) | |
| | Configuration Jumper Block | Master, slave, and cable select modes | |
| | Data Interface Connector | 40-pin, shrouded and keyed, flat ribbon | |
| | Environmental (all conditions non-condensing) | Temperature (operating) | 41° to 122° F (5° to 50° C) |
| | | Relative Humidity (operating) | 10% to 85% |
| | | Maximum Wet Bulb Temperature (operating) | 86° F (30° C) |
| | Certifications, Approvals | MMC II support, multi-read certification, Microsoft WHQL certification, ACA AS/NZS 3548 class B, CNS 13438, C.I.S.P.R. Pub 22, TUV or VDE EN60950, EN 55022, EN55024, SEMKO, NEMKO, DEMKO, FIMKO, EN 60825-1, UL 60950, and CSA C22.2 60950-2000. | |
| | Operating systems supported | Microsoft Windows XP | |
| 48X Combo CD-RW/DVD-ROM | Form Factor | 5.25-inch, half-height, tray-load | |
| | Orientation | Either horizontal or vertical | |
| | Interface type | ATAPI | |
| | Dimensions (W x H x D) | 5.77 x 1.71 x 7.36 in (14.66 x 4.34 x 18.69 cm) (external, excluding bezel) | |
| | Disc diameter | 12 cm, 8 cm | |
| | Disc thickness | 0.05 in (1.2 mm) | |

*Technical Specifications - Optical Storage*

| | | |
|---|---|---|
| Track pitch | 1.6 um (CD), 0.74 um (DVD) | |
| Disc center hole diameter | 0.6 in (15 mm) | |
| Reference scanning velocity | 1.2 m/s (CD); 3.49 m/s (DVD SL); 3.84 m/s (DVD DL) | |
| Read only disc parameters | Formats and modes supported | CD-ROM-Mode 1; CD-ROM XA-Mode 2; CD-Bridge; CD digital audio; CD Extra; Photo CD (single and multi-session); video CD; DVD (single- and double-layer); DVD-R; DVD-RW; DVD-RW Multi-Border; DVD+R; DVD+R Multi-Session , and DVD+RW |
| | Capacity | 180 MB (8 cm); 540 MB (12 cm); 650 MB (12 cm); 700 MB (12 cm); 4.7 GB (DVD-5); 8.54 GB (DVD-9); 9.4 GB (DVD-10) |
| | Block size | Mode 1-2,048 and 2,352 bytes; mode 2, form 1-2,048; 2,328; 2,336; 2,340 and 2,352 bytes; mode 2, form 2-2,328; 2,336; 2,340 and 2,352 bytes; CD-DA-2,352 bytes; DVD-2,048 bytes |
| Writeable disc parameters | Disc type | CD-R and CD-RW |
| | Write methods | Disc at Once, Track at Once, Session at Once, Variable Packet, Fixed Packet |
| | Format and modes supported | CD-ROM; CD-ROM XA; CD digital audio, video CD; CD-Bridge |
| | Capacity | 180 MB (8 cm); 540 MB (12 cm); 650 MB (12 cm); 700 MB (12 cm) |
| | Block size | CD-DA-2,352 bytes; mode 0- 2,336 and 2,352 bytes; mode 1-2,048 and 2,352 bytes; mode 2-2,336 and 2,352; mode 2, form 1-2,048 and 2,352 bytes; mode 2, form 2-2,324 and 2,352 bytes |
| Access times (typical reads, including settling) | Random DVD | < 140 ms (typical) |
| | Random CD | < 125 ms, (typical) |
| | Full stroke DVD | < 250 ms (seek) |
| | Full stroke CD | < 210 ms (seek) |
| Data transfer rates | CD-R write | 7200 KB/s (up to 48X) |
| | CD-RW write | 4800 KB/s (up to 32X) |
| | CD-ROM, CD-R, CD-RW read | 7200 KB/s (up to 48X) |
| | DVD ROM read | 21,632 KB/s (16X ) Max |
| Data transfer modes | ATA PIO mode 4); ATA Multi-word DMA mode 2; ATA UltraDMA mode 0; ATA UltraDMA mode 1, mode 2; ATA UltraDMA Mode 3 (default) | |
| | Cache buffer | 2 MB (minimum) |
| | Startup time (single) | < 7 seconds (typical) |
| | Startup time (multi-session) | < 30 seconds (typical) |
| | Stop time | < 4 seconds |

*Technical Specifications - Optical Storage*

| | | | |
|---|---|---|---|
| | **Power** | **Source** | Four-pin, DC power receptacle |
| | | **DC power requirement** | 5 VDC ± 5%-100 mV ripple p-p |
| | | | 12 VDC ± 5%-200 mV ripple p-p |
| | | **DC current** | 5 VDC (< 1000 mA typical, < 1600 mA maximum) |
| | | | 12 VDC (< 600 mA typical, < 1400 mA maximum) |
| | | **Total drive power** (standby mode) | < 2.5 Watt |
| | **Audio output level** | 0.7 Vrms (typical) | |
| | **Configuration jumper block** | Cable select (default), master and slave modes | |
| | **Data interface connector** | 40-pin, shrouded and keyed, flat ribbon | |
| | **Environmental** (all conditions non-condensing) | **Temperature** (operating) | 41° to 122° F (5° to 50° C) |
| | | **Relative humidity** (operating) | 10% to 90% |
| | | **Maximum wet bulb temperature** (operating) | 86° F (30° C) |
| | **Certifications, requirements** | MPC-3 compliant, multi-read requirements, ACA AS/NZS 3548, ANSI C63.4-1992, ATAPI Spec SFF-8020, ATA Spec X3T9.2, CB Bulletin No. 92A, CSA C22.2 No. 950-1995, C.I.S.P.R. Pub 22, EMKO-TSE 207/94, TUV or VDE EN60 950, EN60825-1, Microsoft ®PC2001 certification, Microsoft Logo for Windows XP, 2000 | |
| | **Operating systems supported** | Microsoft Windows XP Professional, Windows XP Home | |
| **16X DVD+/-RW LightScribe Drive** (Double Layer/Dual Format) | **Form Factor** | 5.25-inch, half-height, tray-load | |
| | **Orientation** | Either horizontal or vertical | |
| | **Interface type** | ATAPI/EIDE | |
| | **Disc recording capacity** | 8.5 GB DL or 4.7 GB standard | |
| | **Dimensions** (W x H x D) | 5.9 x 1.7 x 8.0 in (15.0 x 4.4 x 20.3 cm) | |
| | **Weight** (max) | 2.6 lb (1.2 kg) | |
| | **Write speed** | DVD+R | Up to 16X |
| | | DVD+RW | Up to 4X |
| | | DVD+R DL | Up to 2.4X |
| | | DVD-R | Up to 8X |
| | | DVD-RW | Up to 4X |
| | | CD-R | Up to 40X |
| | | CD-RW | Up to 24X |
| | **Read speed** | DVD+R/-R/+RW/ -RW/+R DL | Up to 8X |
| | | DVD-ROM | Up to 16X |
| | | CD-ROM, CD-R | Up to 40X |
| | | CD-RW | Up to 32X |

*Technical Specifications - Optical Storage*

| | | |
|---|---|---|
| Access time (typical reads, including settling) | Random | DVD: < 130 ms (typical), CD: < 120 ms (typical) |
| | Full Stroke | DVD: < 240 ms (seek), CD: < 200 ms (seek) |
| | Startup Time | Single-session: < 15 seconds (typical), Multi-session: < 30 seconds (typical) |
| | Stop Time | < 4 seconds |
| | Cache Buffer | 2 MB (minimum) |
| | Data Transfer Modes | ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA Mode 3 (44.4 MB/s -default) |
| Power | Source | Four-pin, DC power receptacle |
| | DC Power Requirement | 5 VDC ± 5%-100 mV ripple p-p |
| | | 12 VDC ± 5%-200 mV ripple p-p |
| | DC Current | 5 VDC (< 1000 mA typical, 1600 mA maximum) |
| | | 12 VDC (< 600 mA typical, 1400 mA maximum) |
| | Total Drive Power (standby mode) | < 2.5 Watt |
| Audio output | Line-Out | 0.7 VRMS |
| | Signal-to-Noise Ratio | 74 dB |
| | Channel Separation | 65 dB |
| Environmental conditions (operating - non-condensing) | Temperature | 41° to 122° F (5° to 50° C) |
| | Relative humidity | 10% to 90% |
| | Maximum wet bulb temperature | 86° F (30° C) |
| System configuration | Intel Pentium III Processor or later with 128 MB of memory (required); 256 MB recommended 2-D or 3-D graphics cards on primary disk drive for operating system and application software; second disk drive for audio and video data | |
| Operating systems support | Microsoft Windows XP Professional, Windows XP Home | |
| Regulatory approvals | MPC-3 compliant, multi-read requirements, ATA Spec X3T9.2, ATAPI Spec T13.1153D, ANSI C63.4-1992, UL 1950, ACA AS/NZS 3548, CB Bulletin No. 96A, CSA C22.2 No. 950-1995, CFR 47 C.I.S.P.R. Pub 22 Class B, DHHS/FDA, EMKO-TSE 07/94, TUV EN60950, EN60825-1, MIC, BSMI-CNS 13438, CE, Microsoft PC2001 certification, Microsoft Logo for Windows XP and 2000. | |

| | | | |
|---|---|---|---|
| HP 1.44-MB Diskette Drive | Size | 3.5 in (8.89 cm) | |
| | LED Indicators (front panel) | Green | |
| | Read/Write Capacity per Diskette (high/low) | 1.44 MB/720 KB | |
| | Drive Height | One-third | |
| | Drive Rotation | 300 rpm | |
| | Transfer Rate (high/low) | 500/250 KB/s | |
| | Bytes/Sector | 512 | |
| | Sectors/Track (high/low) | 18/9 | |
| | Tracks/Side (high/low) | 80/80 | |
| | Access Times | Track-to-Track (high/low) | 3/6 ms |
| | | Average (high/low) | 94/173 ms |
| | | Settling Time | 15 ms |
| | | Latency Average | 100 ms |
| | Cylinders (high/low) | 80/80 | |
| | Read/Write Heads | Two | |

| | | | |
|---|---|---|---|
| HP 16-in-1 Media Card Reader | USB interface | USB 2.0 High-speed device via PCI card or pass -through via internal USB port of system board | |
| | Advance protocol support | • Supports hardware ECC (Error Correction Code) function<br>• Supports hardware CRC (Cyclic Redundancy Check) function<br>• Supports MS 4-bit parallel transfer mode<br>• Supports MS-PRO 4-bit parallel transfer mode<br>• Supports SD 4-bit parallel transfer mode<br>• Supports high-speed 50 MHz SD 4-bit card (version 1.1)<br>• Support high-speed 52 MHz MMC 8-bit card (version 4.x) | |
| | Supported media types | • Supports CompactFlash Card Type I (CF I), CompactFlash Card Type II (CF II),MicroDrive (MD)<br>• Supports 3.3V SmartMedia Card (SM), SmartMedia ROM (SM ROM), xD-Picture Card (xD)<br>• Supports Secure Digital Card (SD), Secure Digital ROM Card (SD ROM), miniSD, MultiMediaCard (MMC), Secure MultiMediaCard (Secure MMC), ROM Type MultiMediaCard (MMC ROM), Reduced Size MultiMediaCard (RS MMC), MultiMediaCard 4.0 (MMC Plus), Reduced Size MultiMediaCard 4.0 (MMC Mobile)<br>• Support Memory Stick (MS), Memory Stick ROM (MS ROM), MagicGate Memory Stick (MG), Memory Stick Select, Memory Stick Duo (MS Duo), Memory Stick PRO (MS-PRO), Memory Stick PRO Duo (MS PRO Duo) | |
| | Mechanical | Length (3.5") | 124.7 cm |
| | | Width (3.5") | 101.6 cm |
| | | Height (3.5") | 25.4 cm |
| | | Length (5.25") | 171.6 cm |
| | | Width (5.25") | 148.9 cm |
| | | Height (5.25") | 42.7 cm |

*Technical Specifications - Removable Storage*

| | | |
|---|---|---|
| Environmental | Operational environmental extremes | Test Parameters/Conditions - Power applied, unit operating on system ±5% nominal supply voltage.<br>10°C 10% R.H. = 24 hours<br>10°C 90% R.H. = 24 hours<br>20°C 90% R.H. = 24 hours<br>30°C 90% R.H. = 24 hours<br>40°C 90% R.H. = 24 hours<br>50°C 90% R.H. = 24 hours<br>50°C 10% R.H. = 24 hours |
| | Storage environmental extremes | Test Parameters/Conditions<br>60°C @ 80% R.H. for 96 hours<br>-30°C @ 20% R.H. for 48 hours<br>No power applied<br>Delta °C < 1.0°C/min<br>Delta % R.H. < 1.5% R.H./min |
| Operating system support | Microsoft Windows 2000 (Service Pack 3 or greater), Windows XP Home, Windows XP Professional | |
| Approvals | USB-IF, WHQL, Compliant with USB Mass Storage Class Bulk only Transport Specification Rev. 1.0, Compliant Intel Front Panel I/O Connectivity Design Guide V. 1.2<br>FCC, CE, BSMI, C-Tick, VCCI, MIC, cUL, TUV-T | |

## Environmental Data

**Eco-Label Certifications & declarations**

This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- US Energy Star
- Blue Angel
- US Federal Energy Management Program (FEMP)
- Taiwan Green Mark
- IT ECO declaration

**System Configuration**

The configuration used for the Energy Consumption and Declared Noise Emissions data for the Convertible Mini tower Desktop model included:

| | |
|---|---|
| **Processor** | Intel Pentium 4 630 Processor (3.0-GHz, 2-MB L2 cache, 800-MHz FSB) |
| **Memory** | 1-GB DDR2 Synch Dram PC2-5300 (667-MHz) |
| **Hard Drive** | 160-GB SATA (7200 rpm) |
| **Optical Drive** | 48X Combo CD-RW/DVD-ROM |
| **Other Storage** | HP 16-in-1 Media Reader and additional USB 2.0 port |
| **Communications** | Integrated Realtek 8100C Fast Ethernet Network Connection, Agere 56K PCI Modem |

**Energy Consumption**

Ultra-Slim Desktop, Small Form Factor, Convertible Minitower

| | 115VDC | 230VDC | 100VDC |
|---|---|---|---|
| Normal Operation | 83.7 W | 83.0 W | 84.5 W |
| Sleep | 2.81 W | 3.33 W | 2.53 W |
| Off | 1.44 W | 1.96 W | 1.25 W |

**Heat Dissipation***

| | 115VDC | 230VDC | 100VDC |
|---|---|---|---|
| Normal Operation | 286 BTU/hr | 283 BTU/hr | 289 BTU/hr |
| Sleep | 10 BTU/hr | 11 BTU/hr | 9 BTU/hr |
| Off | 5 BTU/hr | 7 BTU/hr | 4 BTU/hr |

*NOTE: Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

This product is in compliance with US executive order 13221, WOL (wake on LAN) disabled.

**Declared Noise Emissions** (in accordance with ISO 7779 and ISO 9296)

| | Sound Power ($L_{Wad}$, bels) | Deskside Sound Pressure ($L_{pAm}$, decibels) |
|---|---|---|
| Idle | 4.07 | 31.1 |
| Fixed Disk (random writes) | 4.12 | 32.3 |
| Optical Drive (sequential reads) | 5.21 | 45.6 |

**Longevity and Upgrading**

This product is designed to be upgraded, possibly extending its useful life by several years. Spare parts are available throughout the warranty period and for up to 15 months after the end of production. Upgradeability features contained in the product include:

- 6 USB ports
- 2 external 5.25" drive bays
- 2 internal 3.5" drive bays
- 1 external 3.5" drive bay
- 2 empty standard PCI slots
- 1 empty standard PCI-EX1 slot
- 1 empty standard PCI-EX 16 slot
- 2 memory slots
- 1 Serial port
- 1 Parallel port

**Batteries**

This product complies with ISO standards:

- EU Directive 91/ 157/ EEC
- EU Directive 93/ 86/ EEC
- EU Directive 98/ 101/ EEC

Batteries used in the product do not contain:

- Mercury greater the 5ppm by weight
- Cadmium greater than 10ppm by weight
- Lead greater than 4000ppm by weight.

Battery size: CR2032 (coin cell)
Battery type: Lithium

**Additional Information**

This product is in compliance with the IEEE 1680 (EPEAT) standard at the SILVER level, see http://www.epeat.net.

This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive – 2002/95/EC.

This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.

Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.

This product contains 75% recycled materials (by wt.)

This product is 75% recycle-able when properly disposed of at end of life.

Packaging Materials

- External:
  - Corrugated Paper 1840 g
- Internal:
  - LDPE Foam 280 g
  - LDPE Bag 50 g

**Material Usage**

This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants - may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

**Packaging**

HP follows these guidelines to decrease the environmental impact of product packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

**End-of-life Management and Recycling**

Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.

| | |
|---|---|
| Hewlett-Packard Corporate Environmental Information | For more information about HP's commitment to the environment:<br>Global Citizenship Report<br>http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html<br>Eco-label certifications<br>http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html<br>ISO 14001 certificates:<br>http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html |

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